

## UNIVERSAL TOOL FOR SUPERVISING AND DRIVING AUTOMATONS

The present invention relates to a universal tool for supervising and driving automatons.

The automatons in question here may be small micro-automatons (a few centimeters in size) as well as bigger automatons and these devices can not only drive various machines (motors, activators, robots, etc.) but also supervise sensors.

Known automaton control devices may be general-purpose supervisors that are complicated, costly and difficult to carry from one type of platform to another and/or difficult to customize, or else they may be dialog and parameterizing interfaces, dedicated to a specific product with limited, fixed and closed-ended functions, which are also difficult to carry and customize.

An object of the present invention is a tool for the supervision and driving of automatons that is provided with many powerful functions and is simple, economical and capable of being carried on different platforms, especially on PCs.

The tool according to the invention is a universal tool for supervising and driving automatons by means of a microcomputer connected to these automatons which are provided with their data-exchange functions and it comprises an automaton interface driver exchanging commands and/or data with a spreadsheet program executed on the microcomputer, this driver furthermore exchanging data and/or commands with at least one automaton through the communications means of the microcomputer and its operating system.

The present invention will be understood more clearly from the following detailed description of an embodiment given as a non-restrictive example with reference to the appended drawing, wherein the single figure is a block diagram of a tool according to the invention.

The tool 1 of the single figure in the drawing comprises a microcomputer 2, for example of the PC type. One of the programs with which this microcomputer is equipped is a spreadsheet program 3, for example the EXCEL spreadsheet program. This spreadsheet program 3 sends commands and/or data elements to an automaton interface driver 4 and receives data therefrom. This driver 4 communicates with the operating

system 5 of the microcomputer. The system 5 has access to at least one communications line 6 connected to an input-output port 7 of the microcomputer. This communications line 6 may be a serial or parallel type of line, or it may be a bus. The line 6 is connected to a set 8 of automatons.

The term "autaton" herein designates "smart" automated components, namely components provided at least with means by which they can communicate with the microcomputer 2 through the communications line 6 in at least one direction, to receive commands and/or data and/or to transmit data (such as measured physical variables in the case of sensors, or positions in the case of mobile components, or states in the case of selector switches for example). Advantageously, these components have a memory in which data can be stored on their characteristics or their operation. Examples of such components are activators, sensors, servo valves, relays, programmable automatons or remote input/output units, namely units distinct from the microcomputer and automation components connected to the line 6 and comprising at least one analog-digital converter and/or one digital-analog converter as well as a multiplexer and/or a demultiplexer or again program automatons with the same functions as the remote inputs/output units with, moreover, the capacity to perform automation sequences on their own.

The driver 4 manages and optimizes the dialog between the microcomputer 2 and the automatons 8 through the operating system 5. It emulates the proprietary language for the control and/or dialog and/or parameterizing and/or program downloading functions of the automatons 8. It organizes the commands coming from the spreadsheet program in the form of messages in order to send them to the automatons 8 and it extracts data from the messages that reach the automatons in order to transmit them in appropriate form to the program. These messages naturally must be compatible with the transmission characteristics on the line 6.

The making of the driver 4 will be evident to those skilled in the art with knowledge of this proprietary language and the programming of the microcomputer.

The various functions of the tool of the invention are the following:

It changes the state of any autaton of the unit 8, initializes, starts, stops, parameterizes, tests any autaton, downloads a program into

any automaton, etc.).

As the case may be, it can modify one or more specific parameters of at least one of the automatons 8 (for example a parameter such as rotation speed in the case of a motor, etc.).

It enables the iterative reading, for a defined period (the sampling period compatible with the characteristics of the operating system 5) of a set of data arranged in an order (generally the rising order) in a column or in a line of the program 3 at the rate of one sample per cell.

It can be used to obtain a variation in time of a graphic attribute (size, color, position, plane, etc.) of a drawing, an image, a film or any object that can be drawn or imported into the spreadsheet program, as a function of the digital value or the state of a data element read in the memories of an automaton.

It can be used to associate an action with a graphic object or a dialog interface of the spreadsheet program by modifying a data element implanted in the memory of the automaton.

Thus, the user can have available a set of examples of actuation and dialogs that can be processed with the spreadsheet program in a system of development such as Visual Basic, Visual C, etc. He can then build a customized mini-supervisor while using another well-known and widely used tool such as the spreadsheet program. Furthermore, if the program is dynamically associated with at least one other program, for example if it forms part of an integrated program such as OFFICE, the user can use this other program to process, namely store, present, analyze and classify all data or combinations of data coming from the automatons.

Naturally, the driver 4 is designed in such a way that it does not disturb the dynamic links between the spreadsheet program and the other programs associated with it.